IntesisBox®

USB-ENO-ASCII-U v.1.0.0

USB-ENO-ASCII-U-C v.1.0.0

USB ASCII to EnOcean gateway

User's Manual

r0 eng

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Intesis Software S.L.
Milà I Fontanals, 1 bis, 1º
08700 Igualada
Spain

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2 models are available for this gateway, with the following **Order Codes**:

USB-ENO-ASCII-U
EnOcean communication frequency: 868 MHz
USB-ENO-ASCII-U-C
EnOcean communication frequency: 315 MHz

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URL http://www.intesis.com
Email info@intesis.com
tel +34 938047134

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1. Presentation

Supervision and control of any Enocean device from USB enabled controllers or PC software using simple text messages.

IntesisBox® USB-ENO-ASCII-U / C gateways allow supervision and bidirectional control of any EnOcean device from PC systems such as SCADA's or others using simple text messages.

1.1. *Main Features:*

- Bidirectional: Supervision and Control.
- Up to 128 transmission channels.
- Up to 99 reception channels
- Control of EnOcean devices using simple text messages.
- Spontaneous messages avoid continuous polling
- Fast and easy commissioning.
- USB Powered. No external power supply needed.
- Plug and Play (virtual COM port).
- Suitable look for home applications.
- Small dimensions.

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1.2. *Typical application*

In Figure 1.1 it is shown a typical integration example using the USB-ENO-ASCII-U / C

Figure 1.1 Integration example

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2. Connection and placement

2.1. *Connection*

1. Plug the gateway to the USB port of the computer or control system.
2. The red USB LED (Figure 2.1) will turn on. Once the device has been recognized a virtual COM port is going to be generated and the LED will turn off.
3. To communicate with the gateway use this port.

i. Serial Port communication settings:

Baud rate	9600 bps
Stop bit	1
Data bits	8
Flow control	None
Parity	No Parity

Table 2.1 Serial port communication settings

2.2. *Placement*

The coverage distance (see Table 2.2) of the signal emitted by the USB-ENO-ASCII-U / C, or by any other EnOcean device, is determined by the room geometry and where they are placed. As an example, long narrow corridors with wide walls are an adverse situation. People or other obstacles can reduce the coverage distance too. Is therefore advice to always think in the worst possible scenario to decide the placement of the device to ensure a good stability in the radio system.

Conditions	Coverage distance
Line-of-sight connections	typically 30 m range in corridors up to 100 m in halls
Plasterboard walls / dry wood	typically 30 m range, through 5 walls
Brick walls / aerated concrete	typically 20 m range, through 3 walls
Ferroconcrete walls / ceilings	typically 10 m range, through 1 ceiling

Table 2.2 Device coverage distance

ii. Screening zones

It is important not to place the device in a place where the airwaves must go through a metallic object as they create a screening zone where the receivers are not going to be able to receive the EnOcean telegrams. This situation is shown in Figure 2.2a.

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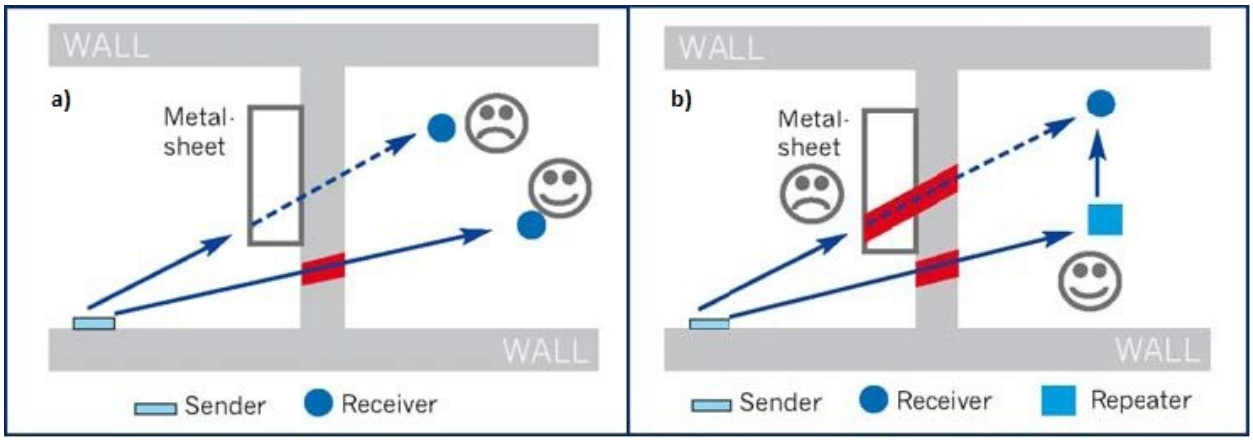

Figure 2.2 a) Screening zone b) solution with a repeater

The situation of one of the receivers doesn't allow it to receive the transceiver telegrams. To solve this situation the use or a repeater outside the screening zone (Figure 2.2b) is recommended. The telegrams will be retransmitted from there to the receiver

iii. Penetration Angle

This is the angle in which the airwaves reach a certain object they need to go through. The transmission to the other side of the object would be better as this angle gets closer to 90 º, being this the best transmission situation

In Figure 2.3a it is shown a receiver in a situation where the penetration angle is too close to 0º. The solution to that problem can be seen in Figure 2.3b using a repeater in a different position

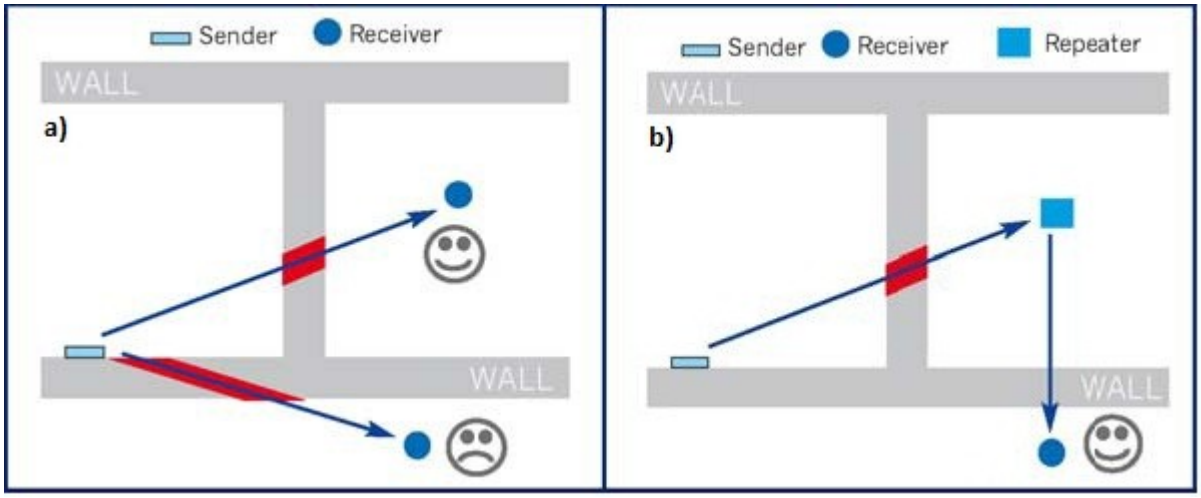

Figure 2.3 Penetration angle

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iv. Use of repeaters

In case of a poor radio reception, it may be helpful to use a repeater. EnOcean repeaters do not require any configuration, only a line-power supply is needed. A poor radio signal is received, refreshed and transmitted again, so nearly a double radio range can be achieved. Special EnOcean repeaters which can be switched to 2-level function allow two repeaters to be cascaded.

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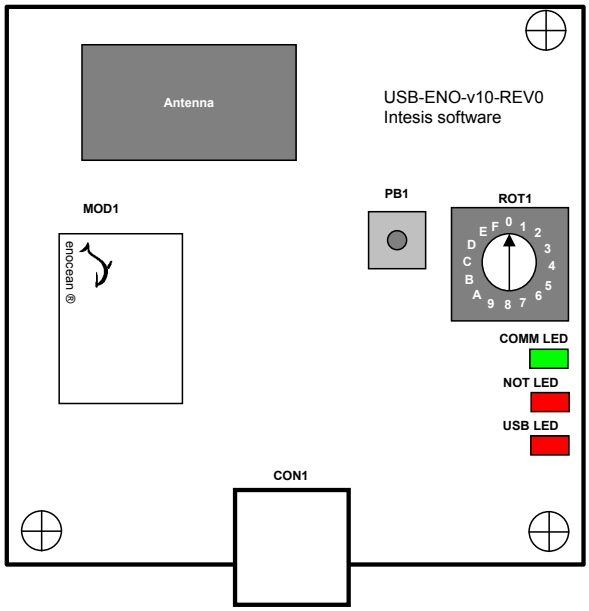
3. Device Hardware

In Figure 3.1 an schematic of the device can be seen.



PB1: Button (not used in USB-ENO-ASCII-U)

ROT1: Configuration selector (not used in USB-ENO-ASCII-U)

MOD1: Enocean module

CON1: USB connector

USB LED: USB LED (red)

CONF LED: Configuration LED (red)

COMM LED: communication LED (green)

Figure 3.1 Device diagram

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4. Commands

All queries and responses have the same structure, which consists of one keyword followed by a comma and a list of parameters separated by commas. The following generic representation may help to understand this structure:

<keyword>,<parameter_1>,…,<parameter_n>

When a command is sent to USB-ENO-ASCII-U, it is executed by sending a carriage return (\r). Combinations with line feed are accepted, such as \r\n and \n\r.

If user is typing commands manually, or a buffer flush is needed by some reason, sending the character with ASCII value 26 (CTRL+Z) will produce a flush into the command reception buffer of USB-ENO-ASCII-U, and the device will answer with a carriage return (\r)

The sections 4.4 to 4.10 follow the same structure: A request and a response section (and their subsections if apply). In them the commands specific implementation of the abovementioned structure is explained.
A subset of replies has been defined:

- Command confirmation: It only specifies if the command has been accepted and transmitted, or not
- Procedure confirmation: It specifies if the procedure has been executed successfully or not
- Answer for an specific channel: Value/s of the command in the enquired channel
- Answer for all channels: Value of the command for all channels

4.1. *Commands quick reference*

Command	***Meaning***	***Section***
RX	Read received EnOcean Data	Section 4.5
SP	Spontaneous Data Received	Section 4.6
LR	Learn Rx Channel	Section 4.7
GR	Get Rx Channel	Section 4.8
DE	Delete Rx Channel	Section 4.9
CF	IBOX Configuration	Section 4.4
ID	Identification	Section 4.10
ER	Error	Section 4.2
OK	OK	Section 4.3

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4.2. *Error (ER) values*

Error Code	*Enumeration Name*	*Description*
1	ERR_NOT_LINKED	Not linked channel
2	ERR_SYNTAX	Syntax error
3	ERR_INCORRECT_CHANNEL	Incorrect channel (channel out of range)
4	ERR_INCORRECT_VALUE	Incorrect value (value out of range)
5	ERR_INCORRECT_PARAM_INDEX	Incorrect parameter index (index out of range)
6	ERR_TOO_LONG_COMMAND	Entered string is too long (> 63 characters)

4.3. *OK values*

OK Code	*Enumeration Name*	*Description*
0	OK_COMMAND	Command received and parsed OK

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4.4. *Configuration*

4.4.1. Configuration request

Description			
Sets or gets a configuration parameter in the USB-ENO-ASCII			
Keyword			
CF			
Parameters			
Index	**Size**	**Description**	**Allowed Values**
1	2	Configuration Parameter number	01 to 06
2	2	Value	?? – requests parameter value Other values in following table

Configuration parameters allowed values			
Parameter number	**Size**	**Description**	**Allowed Values**
01	2	Spontaneous sending enabled	0 - Disable 1 - Enable (default)
02	2	Echo enabled	0 – Disable (default) 1 - Enable
03	2	Error Led enabled	0 - Disable 1 - Enable (default)
04	2	Communication and learning Led enabled	0 - Disable 1 - Enable (default)
05	2	Spontaneous to ASCII are sent on every known EnOcean telegram received. If disabled, spontaneous to ASCII are sent only when data in EnOcean telegram has changed	0 – Disable 1 – Enable (default)
06	2	Repeater mode	0 – Disable (default) 1 – 1-Level repeater 2 – 2-Level repeater

Important	
Configuration parameters are stored in internal flash. Periodic writing must be avoided due to limited write cycles to flash memory.	
Examples	**Description**
CF,01,01\r	Enables spontaneous messages
CF,01,??\r	Request if the spontaneous messages are enabled or not

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4.4.2. Configuration response

4.4.2.1. Configuration command and procedure confirmation

Description			
It's a configuration command confirmation			
Keywords			
OK ER			
Parameters			
Index	**Size**	**Description**	**Allowed Values**
1	1	Error or OK index	OK_COMMAND ERR_SYNTAX ERR_INCORRECT_PARAMETER_INDEX
Examples		**Description**	
OK,0\r		The write command was correct	
ER,3\r		Syntax error in the write command	

4.4.2.2. Configuration answer

Description			
It only applies when there is an enquire in the channel			
Keyword			
CF			
Parameters			
Index	**Size**	**Description**	**Allowed Values**
1	2	Configuration Parameter	01 to 06
2	2	Value of the parameter	Values from the request table
Examples		**Description**	
CF,01,01\r		Spontaneous messages are enabled	

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4.5. *Read received Data*

4.5.1. Receive request

Description			
Request the last info received in the given Rx Channel			
Keyword			
RX			
Parameters			
Index	**Size**	**Description**	**Allowed Values**
1	2	Channel index	01 to 99 – Channel
Important			
Examples		**Description**	
RX,01\r		Requests data from Rx Channel 01	

4.5.2. Receive response

Description			
Receive command reply			
Keywords			
RX			
Parameters			
Index	**Size**	**Description**	**Allowed Values**
1	2	RX Channel Index	01 to 99 – Channel
2	2	Number of bytes (n)	01 to 04
3	2	Data Byte 0 (Hex)	00 to FF
…	2	…	00 to FF
n+2	2	Data Byte n-1 (Hex)	00 to FF
n+3	2	Status Byte (Hex)	00 to FF
Examples		**Description**	
RX,01,04,0F,74,7B,E2,00\r		The received data is a 4-byte length array with values {0x0F, 0x74, 0x7B, 0xE2} and status 0x00	
Keyword2			
ER			
Parameters			
Index	**Size**	**Description**	**Allowed Values**
1	1	Error index	ERR_SYNTAX ERR_INCORRECT_CHANNEL
Examples		**Description**	
ER,4\r		Incorrect channel (the channel written is out of the valid range)	

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4.6. *Spontaneous*

4.6.1. Spontaneous notification

Description			
Spontaneous received data			
Keywords			
SP			
Parameters			
Index	**Size**	**Description**	**Allowed Values**
1	2	RX Channel Index	01 to 99 – Channel
2	2	Number of bytes (n)	01 to 04
3	2	Data Byte 0 (Hex)	00 to FF
…	2	…	00 to FF
n+2	2	Data Byte n-1 (Hex)	00 to FF
n+3	2	Status Byte (Hex)	00 to FF
Examples		**Description**	
SP,01,04,0F,74,7B,E2,00\r		The received data is a 4-byte length array with values {0x0F, 0x74, 0x7B, 0xE2} and status 0x00	

4.7. *Learning Rx Channel*

4.7.1. Learning request

Description			
Set a Rx Channel to Learning Mode			
Keyword			
LR			
Parameters			
Index	**Size**	**Description**	**Allowed Values**
1	2	Channel index	00 – Exits Learning mode 01 to 99 – Channel
Important			
Examples		**Description**	
LR,00\r		Exits commissioning mode	
LR,03\r		Sets channel 03 to Learning mode. If a teach-in telegram from an EnOcean device is received this device is going to be linked to rx channel 03	

4.7.2. Learning reply

4.7.2.1. Learning Command Confirmation

Description			
Learning Command Confirmation			
Keywords			
OK ER			
Parameters			
Index	**Size**	**Description**	**Allowed Values**
1	2	Error or OK index	OK_COMMAND ERR_INCORRECT_CHANNEL
Examples		**Description**	
OK,0\r		The Remote commissioning command was executed successfully	
ER,4\r		Incorrect channel (the channel written is out of the valid range)	

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4.7.2.2. Learning Procedure Confirmation

Description			
Learning Procedure Confirmation. Correct Teach-in received from a device. It stores the sent data to the IBOX			
Keywords			
LR			
Parameters			
Index	**Size**	**Description**	**Allowed Values**
1	2	Channel index	01 to 99 – Channel
2	2	ORG (Hex)	ORG of device linked to this Rx Channel
3	2	Function (Hex)	Function of device linked to this Rx Channel
4	2	Type (Hex)	Type of device linked to this Rx Channel
5	4	Manufacturer (Hex)	Manufacturer of device linked to this Rx Channel
6	8	ID (Hex)	ID of device linked to this Rx Channel
Examples		**Description**	
LR,01,07,10,02,0002,00038263\r		The linked device in Channel 01 has the EEP [07-10-02], Manufacturer is 0x0002 (Thermokon) and its ID is 0x00038263	

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4.8. *Get Rx Channel*

4.8.1. Get Rx Channel Request

Description			
Obtains info about the given Rx Channel Index			
Keyword			
GR			
Parameters			
Index	**Size**	**Description**	**Allowed Values**
1	2	Channel index	01 to 99 – Channel
Important			
Examples			
GR,**\r		Request for info about all Rx channels	
GR,01\r		Request for info about channel 01	

4.8.2. Get Rx Channel Reply

Description			
The info about this Rx Channel Index			
Keywords			
GR			
Parameters			
Index	**Size**	**Description**	**Allowed Values**
1	2	Channel index	01 to 99 – Channel
2	2	ORG (Hex)	ORG of device linked to this Rx Channel
3	2	Function (Hex)	Function of device linked to this Rx Channel
4	2	Type (Hex)	Type of device linked to this Rx Channel
5	4	Manufacturer (Hex)	Manufacturer of device linked to this Rx Channel
6	8	ID (Hex)	ID of device linked to this Rx Channel
Examples		**Description**	
GR,01,07,10,02,0002,00038263\r		The linked device in Channel 01 has the EEP [07-10-02], Manufacturer is 0x0002 (Thermokon) and its ID is 0x00038263	
OR,94,FF,FF,FF,FFFF,FFFFFFFF\r		There is no linked device in Rx Channel 94	

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4.9. *Delete Device*

4.9.1. Delete Device Request

Description			
Deletes the device linked to the given Rx Channel Index			
Keyword			
DE			
Parameters			
Index	**Size**	**Description**	**Allowed Values**
1	2	Channel index	01 to 99 – Channel
Important			
Periodic writing must be avoided due to limited write cycles to flash memory.			
Examples		**Description**	
DE,01\r		Delete device linked to Rx Channel 01	

4.9.2. Delete Response

4.9.2.1. Delete command confirmation

Description			
Device deleted response			
Keywords			
OK ER			
Parameters			
Index	**Size**	**Description**	**Allowed Values**
1	2	OK index	OK_COMMAND ERR_INCORRECT_CHANNEL
Examples		**Description**	
OK,0\r		Device deleted successfully from the given Rx Channel	

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4.10. *Identification*

4.10.1. Identification request

Description	
Retrieves device information	
Keyword	
ID	
Parameters	
No parameters	
Example	**Description**
ID\r	Retrieves device information

4.10.2. Identification response

Description
Device information containing: • Device name • Firmware version • Manufacturer
Keyword
OK. It is used to terminate the information
Example
USB-ENO-ASCII-U\r FW ver: v1.0.0\r Intesis Software, SL (C) 2011\r \r OK,0\r

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5. Technical data and dimensions

The main features of the devices USB-ENO-ASCII-U / C are shown in Table 5.1. For further detail check the USB-ENO-ASCII-U / C datasheet

Dimensions	*71 x 71 x 27 mm*
Weight	*60 g*
Operating Temperature	*-25 . . . 85ºC*
Stock Temperature	*-40 . . . 85ºC*
Operating Humidity	*<93% HR, non-condensing*
Stock Humidity	*<93% HR, non-condensing*
Power requirements	USB powered. 50 mA
EnOcean Frequencies	USB-ENO-ASCII-U*: 868 MHz* USB-ENO-ASCII-U-*C: 315 MHz*

Table 5.1 Technical data

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6. Regulations and standards

CE conformity:

R&TTE EU-directive on Radio and Telecommunications Terminal Equipment

The general registration for the radio operation is valid for all EU countries as well as for Switzerland.

Standards:

UNE-EN 50491-3:2010
UNE-EN 60950-1:2007
UNE-EN 61000-6-2:2006
UNE-EN 61000-6-3:2007

FCC ID: SZV-STM300C
IC: 5731A-STM300C

The enclosed device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (i.) this device may not cause harmful interference and (ii.) this device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications made to this equipment not expressly approved by Intesis Software may void the FCC authorization to operate this equipment.

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